

WHAT IS CLAIMED IS:

1 1. An isolated nucleic acid encoding an estrogen-regulated GTP-
2 binding protein gamma-12 subunit protein, wherein the protein comprises the amino acid
3 sequence of SEQ ID NO:1.

1 2. The nucleic acid of claim 1, wherein the nucleic acid is from a
2 mouse.

1 3. The nucleic acid of claim 1, wherein the nucleic acid comprises a
2 nucleotide sequence that is at least about 70% identical to SEQ ID NO:2 or 3.

1 4. The nucleic acid of claim 1, wherein the nucleic acid comprises the
2 nucleotide sequence of SEQ ID NO:2 or 3.

1 5. An expression cassette comprising the nucleic acid of claim 1.

1 6. An isolated eukaryotic cell comprising the expression cassette of
2 claim 5.

1 7. An isolated estrogen-regulated GTP-binding protein gamma-12
2 subunit protein, wherein the protein comprises the amino acid sequence of SEQ ID NO:1.

1 8. The protein of claim 7, wherein the protein is a mouse protein.

1 9. An antibody that selectively binds to the estrogen-regulated GTP-
2 binding protein gamma-12 subunit protein of claim 7, wherein the antibody does not bind
3 to the estrogen-regulated GTP-binding protein gamma-12 subunit protein having the
4 amino acid sequence of SEQ ID NO:4.

1 10. A method of modulating estrogen signaling in a mammalian cell,
2 the method comprising modulating the level of expression or activity of an estrogen-
3 regulated GTP-binding protein gamma-12 subunit protein.

1 11. The method of claim 10, wherein said level of expression of said
2 estrogen-regulated GTP-binding protein gamma-12 subunit protein is modulated by
3 introducing a polynucleotide into said cell, whereby the presence or expression of said
4 polynucleotide modulates said level of expression of said estrogen-regulated GTP-
5 binding protein gamma-12 subunit protein.

1 12. The method of claim 11, wherein said polynucleotide encodes a
2 full-length estrogen-regulated GTP-binding protein gamma-12 subunit protein, and
3 wherein expression of said polynucleotide increases said level of expression of said
4 estrogen-regulated GTP-binding protein gamma-12 subunit protein.

1 13. The method of claim 11, wherein said polynucleotide is an
2 antisense sequence, and wherein the presence or expression of said polynucleotide
3 decreases said level of expression of said estrogen-regulated GTP-binding protein
4 gamma-12 subunit protein.

1 14. The method of claim 10, wherein a compound is administered to
2 said cell, whereby said level of said expression or activity of said estrogen-regulated
3 GTP-binding protein gamma-12 subunit is modulated.

1 15. The method of claim 10, wherein the estrogen signaling is
2 mediated by an estrogen receptor alpha.

1 16. The method of claim 10, wherein the cell is present in a mammal.

1 17. The method of claim 16, wherein the cell is a vascular smooth
2 muscle cell or a vascular endothelial cell.

1 18. The method of claim 16, wherein said level of expression or
2 activity of said estrogen-regulated GTP-binding protein gamma-12 subunit protein is
3 increased, whereby the development of atherosclerosis, osteoporosis, Alzheimer's disease
4 or Parkinson's disease is inhibited in said mammal.

1 19. A method of detecting the presence of estrogen signaling in a
2 mammalian cell, the method comprising detecting the expression of a nucleic acid
3 encoding an estrogen-regulated GTP-binding protein gamma-12 subunit protein.

1 20. The method of claim 19, wherein said nucleic acid is the nucleic
2 acid of claim 1.

1 21. The method of claim 19, wherein said presence of estrogen
2 signaling in said cell is used in order to determine the responsiveness of said cell to
3 estrogen.

1 22. The method of claim 19, wherein said presence of estrogen
2 signaling in said cell is used in order to determine the tissue-specific distribution of
3 estrogen signaling in a mammal.

1 23. The method of claim 19, wherein said expression of said nucleic
2 acid in said cell is detected by detecting the expression or activity of an estrogen-
3 regulated GTP-binding protein gamma-12 subunit protein.

1 24. The method of claim 19, wherein said protein is the protein of
2 claim 7.

1 25. The method of claim 19, wherein said expression of said nucleic
2 acid in said cell is detected by detecting the level of estrogen-regulated GTP-binding
3 protein gamma-12 subunit mRNA in said cell.

1 26. The method of claim 19, wherein the estrogen signaling is
2 mediated by an estrogen receptor alpha.

1 27. A method of identifying a compound capable of acting as an
2 estrogen receptor agonist or antagonist, the method comprising:
3 (1) contacting a cell comprising an estrogen receptor with said compound;
4 and
5 (2) determining the functional effect of said compound on said cell,
6 wherein an increase in the level of estrogen-regulated GTP-binding protein gamma-12
7 subunit mRNA, protein or protein activity in said cell indicates that said compound is
8 capable of acting as an estrogen receptor agonist, and wherein a decrease in the level of
9 estrogen-regulated GTP-binding protein gamma-12 subunit mRNA, protein or protein
10 activity in said cell indicates that said compound is capable of acting as an estrogen
11 receptor antagonist.

1 28. The method of claim 27, wherein the estrogen receptor is an
2 estrogen receptor alpha.

1 29. The method of claim 27, wherein said estrogen-regulated GTP-
2 binding protein gamma-12 subunit mRNA has the sequence of SEQ ID NO:1, or wherein

- 3 said estrogen-regulated GTP-binding protein gamma-12 subunit protein comprises the
- 4 amino acid sequence of SEQ ID No:2 or 3.